Amendments to the Claims:

This listing of claims will replace without prejudice all prior versions and listings of claims in the application:

Listing of Claims:

Claim 1 (original): A method of removing noise from a time-domain based CUBE of seismic data consisting of a plurality of Traces, the method comprising the steps:

transform each said Trace into the frequency-domain, for the purpose of creating a frequency-domain based CUBE of seismic data, wherein the seismic data elements of said frequency-domain based CUBE are complex-valued;

disassemble said frequency-domain based CUBE into a plurality of constant frequency slices, each of said constant frequency slices consisting of a plurality of seismic data elements; and

for each constant frequency slice of said plurality of constant frequency slices:

form one Matrix $A_{m \times n}$ from each said constant frequency slice using said plurality of seismic data elements as the complex-valued elements of said Matrix $A_{m \times n}$;

rank-reduce Matrix $A_{m \times n}$ to create a rank-reduced Matrix $B_{m \times n}$ that is representative of Matrix $A_{m \times n}$;

substitute Matrix $B_{m \times n}$ in place of Matrix $A_{m \times n}$, for the purpose of forming a proxy slice that is representative of said constant frequency slice;

assemble a proxy frequency-domain based cube using said proxy slice,

for the purpose of accessing each proxy trace in a plurality of frequency ordered proxy traces that are representative of said plurality of Traces; and

inverse transform into the time-domain each proxy trace of said plurality of frequency ordered proxy traces, for the purpose of forming a noise-suppressed time-domain based proxy cube representative of said time-domain based CUBE of seismic data.

Claim 2 (original): The method as claimed in claim 1 further comprising the step of correlating said noise-suppressed time-domain based proxy cube with at least one other noise-suppressed time-domain based proxy cube associated with a common seismic data set.

Claim 3 (original): The method as claimed in claim 1 wherein said noise is random noise.

Claim 4 (original): The method as claimed in claim 1 wherein each said Trace is transformed into the frequency-domain using a Discrete Fourier Transform.

Claim 5 (original): The method as claimed in claim 1 wherein said time-domain based CUBE comprises a plurality of time-domain based grids.

Claim 6 (original): The method as claimed in claim 1 wherein the step of rank-reducing said Matrix A $_{m \times n}$ is carried out by decomposition executed using Singular Value Decomposition comprising the steps:

decompose said Matrix A $_{m \times n}$ in accordance with A $_{m \times n}$ = U $\sum$ V^H, where $\sum$ is an ordered diagonal matrix and U and V^H are unitary, for the purpose of ordering the elements of said $\sum$ from largest at a_{11}, a_{22}, a_{33}, decreasing to smallest at a_{mn}; and

forming a Matrix B $_{m \times n}$ that is of rank K where K is less than the lesser of **m** or **n**, and in the ordered diagonal matrix $\sum$ all but the top K elements along the diagonal are zeroed by replacing with zero values all but the top

K elements along the diagonal of Σ to form Σ', after which Matrix A $_{m \times n}$ is recomposed as: B $_{m \times n}$ = U Σ' V^H , where Σ' is the rank-reduced version of Σ having only the top K elements remaining non-trivial.

Claim 7 (original): The method as claimed in claim 1 wherein the step of rank-reducing Matrix A $_{m \times n}$ is carried out by decomposition and only partially executed using Lanczos bi-diagonalization, for the purpose of achieving a reasonable approximation to full decomposition.

Claim 8 (original): The method as claimed in claim 1 wherein the step of rank-reducing Matrix A $_{m \times n}$ is carried out by decomposition executed using the L1 matrix norm.

Claim 9 (original): The method as claimed in claim 6 wherein the top K elements may be weighted or otherwise adjusted or processed.

Claim 10 (original): The method as claimed in claim 6 wherein the value of K is determined by first applying a plurality of values of K and plotting the difference between said Matrix A $_{m \times n}$ and said Matrix B $_{m \times n}$ for each value of K of said plurality of values of K, and then selecting as the value of K that for which the plot of said difference shows insignificant indications of genuine reflector signal, for the purpose of removing noise without distorting genuine reflector signal.

Claim 11 (original): The method as claimed in claim 1 further comprising the step of first spatially dividing the planar surface of a section of seismic data into overlapping planar grids for the purpose of correlating seismic data relating to a specific reflector.

Claim 12 (currently amended): The method as claimed in claim 1 wherein said CUBE is formed using any of:

> [-]a rectangle of traces extracted from a stacked 3-D volume[. The], the trace grid being comprised of inline CMP bins in the row direction[,] and crossline CMP bins in the column direction;

[-]traces from an unstacked 2-D line[. The], the grid [is]being composed of common source traces in the row direction[,] and common receiver traces in the column direction;

[-]traces from an unstacked 3-D volume, where the traces are taken from a single shot line and receiver line[. The], the trace grid being comprised of common source traces in the row direction[,] and common receiver traces in the column direction; or

[-]traces from common-offset or common-angle stacks for a sequence of CMPs[. The], the trace grid being comprised of common-offset or -angle traces in the row direction[,] and CMP traces in the column direction.